Two new *Arhopala* BOISDUVAL taxa from the Solomon Islands, and resolution of the status of *A. tindali* RIBBE and *A. styx* EVANS (Lepidoptera: Lycaenidae)

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Abstract: Background to descriptions of the nominal *Arhopala* taxa *A. tindali* RIBBE, 1899 (male previously unknown) and *A. styx* EVANS, 1957 (female previously unknown) is discussed. Fresh material collected during recent field work indicates that the two are synonymous and *styx* **syn. nov.** is placed as a junior synonym of *A. tindali* **stat. nov.** Two new taxa are described from the Solomon Islands: *A. **mimsyi*** **sp. nov.** (Treasury) and *A. eurisus **tovesi*** **ssp. nov.** (Ulawa) (all type material in BMNH).

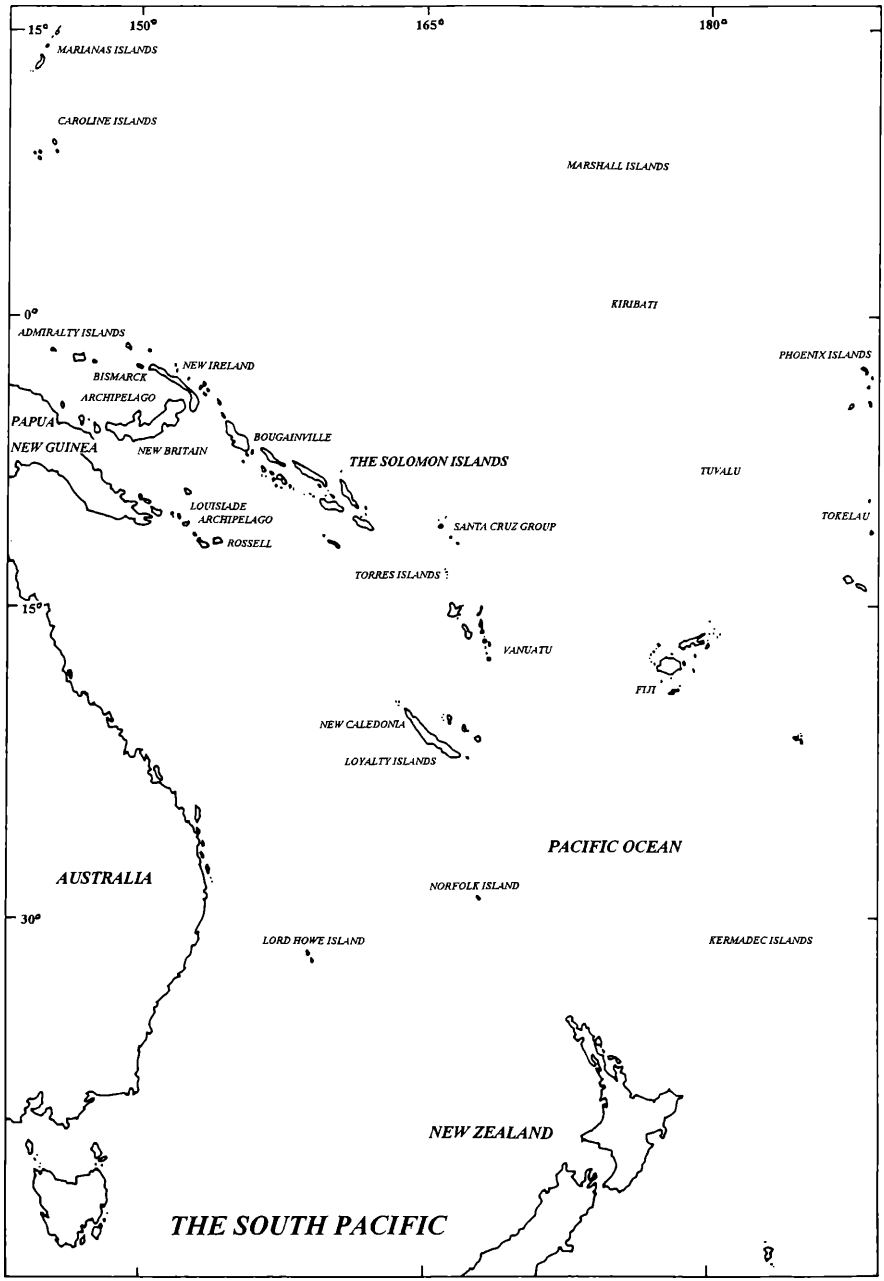
Zwei neue *Arhopala* Boisduval von den Solomonen sowie Aufklärung des Status von *A. tindali* RIBBE und *A. styx* EVANS (Lepidoptera: Lycaenidae)

Zusammenfassung: Der Status der nominellen Taxa *Arhopala tindali* RIBBE, 1899 (♂ zuvor unbekannt) und *A. styx* EVANS, 1957 (♀ zuvor unbekannt) wird anhand von neuem Freilandmaterial diskutiert. Das Taxon *styx* **syn. nov.** wird als jüngeres Synonym von *A. tindali* **stat. nov.** interpretiert. Zwei neue Taxa werden von den Solomonen beschrieben: *A. **mimsyi*** **sp. nov.** (von der Insel Treasury) and *A. eurisus **tovesi*** **ssp. nov.** (von Ulawa) (das Typenmaterial befindet sich im BMNH, London).

Introduction

Arhopala BOISDUVAL, 1832, a large genus of some 200 species, occurs throughout the Indo-Australian Region, reaching its greatest diversity in Sundaland and the Philippines. Often spectacular in appearance, species are characterised by iridescent blue or purple uppersides and sombre brown undersides, with an arrangement of fine lines of diagnostic value. Many taxa are similar in appearance, and identification is often difficult.

The most recent revision of *Arhopala* (EVANS 1957) lists five taxa from the Solomon islands: *A. araxes eurisus* DRUCE, 1891, *A. araxes tindali* RIBBE, 1899, *A. styx* EVANS, 1957, *A. sophrosyne* GROSE-SMITH, 1889, and *A. thamyras phryxus* BOISDUVAL, 1832. To these may be added *A. florinda florinda* GROSE-SMITH, 1896, in appearance more like a species of *Danis* FABRICIUS,



Map 1: The south Pacific.

1807, a polyommatine genus which occurs from the Moluccas eastwards through New Guinea and northern Australia to the Bismarck Archipelago, but structurally clearly an *Arhopala* (ELIOT 1973). FRUHSTORFER (1914: 159) also described *Arhopala meander anicius* from a male specimen from the „Solomon Islands". The political boundaries of the Solomons at that time included Bougainville, now part of Papua New Guinea, and the precise provenance of this specimen, now in the BMNH, London, is unknown. PARSONS (1998: 389) suggested this specimen may be wrongly labelled. It is not clear whether or not *A. meander* BOISDUVAL, 1832, occurs within the present day political boundary of the Solomon Islands.

Additionally, EVANS (1957: 101) described *A. cleander jobina* from a series of specimens of both sexes from various localities in New Guinea. Included in this series was a solitary female bearing a locality label simply stating „New Georgia", and it is possible (this was the only one of six localities for *jobina* to be placed in inverted commas) that EVANS was unsure of where this was. PARSONS (1998: 383) also referred to this specimen and said „1 ♀ (BMNH) from New Georgia in the Solomons differs slightly from *jobina*, but apparently does belong to *cleander*" This female is reassessed in the light of new material (see *A. mimsyi* sp. nov., below).

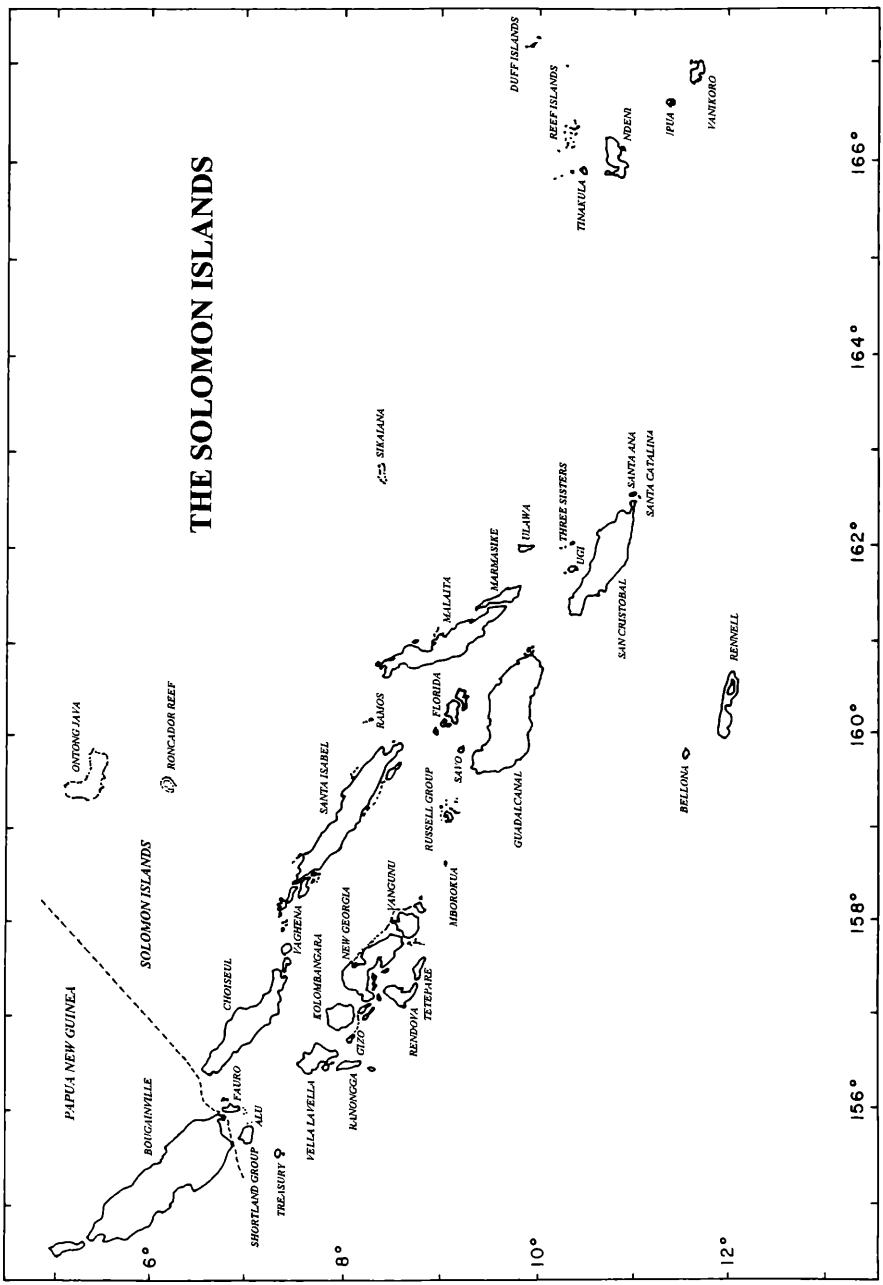
According to PARSONS (1998: 386) EVANS was confused in his treatment of the complex *centaurus* species group, and *eurisus*, considered a subspecies of *A. centaurus* by D'ABRERA (1971 etc.), was raised to species status by PARSONS (1998: 387), based on marked differences in wing shape, colouration and pattern between *centaurus* and *eurisus.* This arrangement is followed here. The systematic position of *tindali* and *styx* is less straightforward and has been open to question.

Abbreviations used:

fw	forewing
fwl	length of forewing
hw	hindwing
unf	underside of forewing

The status of *A. tindali* stat. nov. and *styx* syn. nov.

DRUCE (1891: 371) said „There is a male specimen [actually a female – see below] which is much like *eurisus* on the underside, but on the upperside is of a darker purple and all the margins appear broadly black. It is from Malaita Island, but unfortunately so much broken that I do not

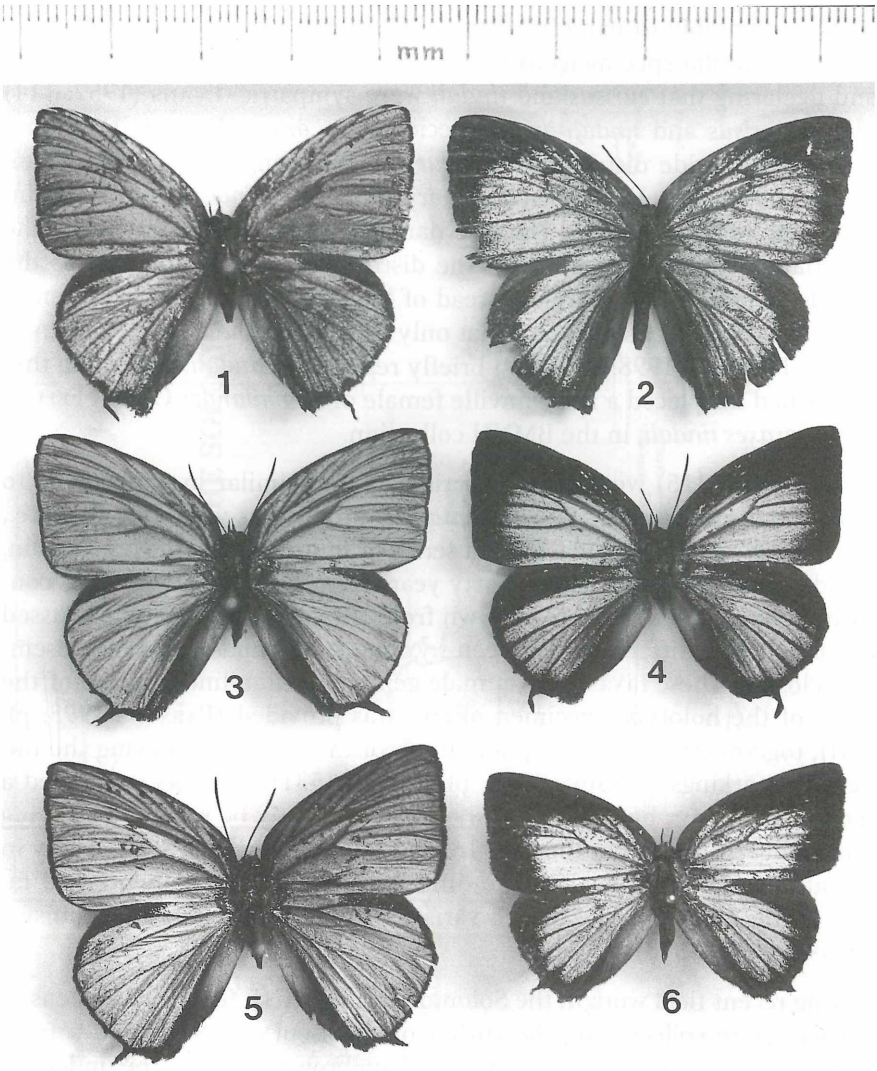


Map 2: The Solomon Islands.

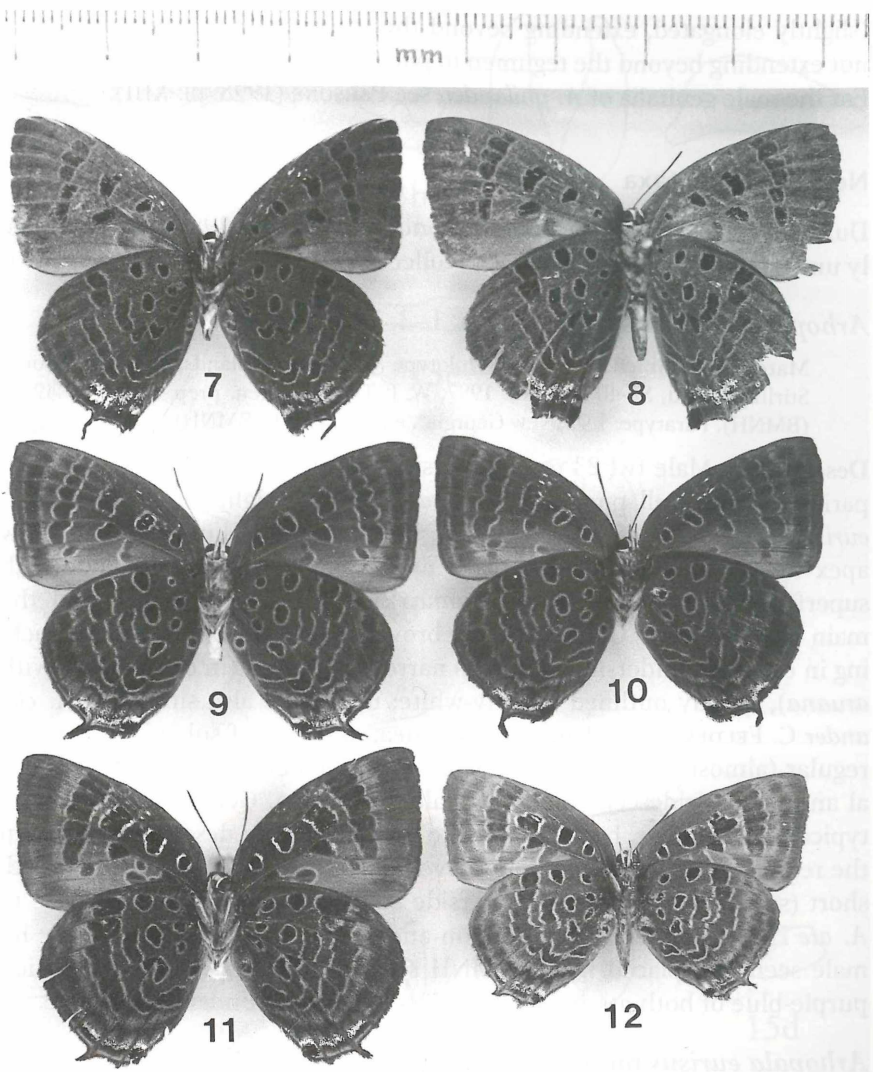
think it advisable to name it". RIBBE (1899: 251) repeated this and gave details of similar specimens from the Shortlands, raising the name *tindali*, and declaring that *eurisus* and *tindali* were sympatric. EVANS (1957: 114) placed *eurisus* and *tindali* as subspecies of *A. araxes* FELDER, 1865, and recognised a wide distribution for *eurisus*, including Bougainville, Choiseul and Treasury. He reported solitary females of *tindali* from Bougainville and Malaita (this is DRUCE's damaged „male") and included the Shortlands (the type locality) in the distribution, suggesting that as the female of *tindali* was „purple instead of blue", it may merely represent a form of *eurisus*. It is significant that only females of *tindali* were known to EVANS. PARSONS (1998: 386, 389) briefly referred to *tindali*, indicating that EVANS had misplaced a Bougainville female of *A. philander* C. & R. FELDER under *araxes tindali*, in the BMNH collection.

EVANS (1957: 115) went on to describe *A. styx*, similar in appearance to *araxes* and other species of the *centaurus* group, but with aberrant (i.e., distinctive?) male genitalia, from a series of four males from New Britain, Guadalcanal and Santa Isabel. Forty years later, PARSONS (1998: 388) confirmed that *styx* was still only known from these four males and discussed exophenotypic differences between *styx* and *A. philander*, which it resembles closely. These taxa differ in male genitalia, and a line drawing of the valve of the holotype specimen of *styx* was provided (PARSONS 1998: pl. XIII), together with a colour photograph of the holotype showing the underside markings (PARSONS 1998: pl. 57, fig. 1531). PARSONS concluded a section on *A. styx* by stating „*A. styx* must presently be regarded as being doubtfully distinct from the New Ireland *philander eichhorni*, especially in the absence of any females. The differences in the above-mentioned facies of the 2 taxa may be due to variation, or possibly even dimorphism" (PARSONS 1998: 388).

During recent field work in the Solomon Islands, fresh female specimens of „*tindali*" were collected by the author on Choiseul and Savo, and a fresh male „*styx*" was taken on Treasury. The deep brown colour of the underside in fresh specimens, and identical underside markings of both sexes, make it clear that the two are synonymous (see figs. 3-4, 9-10). The name *styx* **syn. nov.** is a junior synonym of *A. tindali* **stat. nov.** So far as external appearance is concerned, *A. tindali* is difficult to distinguish from races of *A. philander* (a fresh female from Choiseul is virtually indistinguishable from the female of *philander gazella* [PARSONS 1998: pl. 57, fig. 1551]), but the male genitalia of *tindali* (figs. 13a-e), notably the size and shape of the valve



Figs. 1–6: *Arhopala* adults (upperside). **Fig. 1:** *A. mimsyi* ♂ holotype (Treasury). **Fig. 2:** *A. mimsyi* ♀ paratype (New Georgia). **Fig. 3:** *A. tindali* ♂ (Treasury). **Fig. 4:** *A. tindali* ♀ (Choiseul). **Fig. 5:** *A. eurisus tovesi* ♂ holotype (Ulawa). **Fig. 6:** *A. eurisus tovesi* ♀ paratype (Ulawa).



Figs. 7–12: *Arhopala* adults (underside). **Fig. 7:** *A. mimsyi* ♂ holotype (Treasury). **Fig. 8:** *A. mimsyi* ♀ paratype (New Georgia). **Fig. 9:** *A. tindali* ♂ (Treasury). **Fig. 10:** *A. tindali* ♀ (Choiseul). **Fig. 11:** *A. eurisus tovesi* ♂ holotype (Ulawa). **Fig. 12:** *A. eurisus tovesi* ♀ paratype (Ulawa).

(slightly elongated, extending beyond the tegumen in *tindali*; more squat, not extending beyond the tegumen in *philander*) indicate a separate species. For the male genitalia of *A. philander*, see PARSONS (1998: pl. XIII).

New *Arhopala* taxa

During field work in the Solomon Islands in 1996 and 1997, two previously undescribed *Arhopala* taxa were collected:

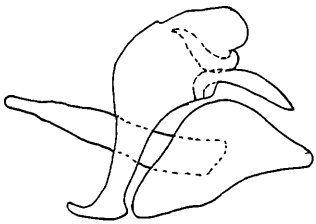
Arhopala mimsyi sp. nov. (figs. 1-2, 7-8, 14a-e)

Material examined: (1 ♂, 1 ♀): Holotype ♂, Solomon Islands, Treasury Group, Stirling Island, SL-40 m, 2. XII. 1997, W. J. TENNENT (gen. prep. BMNH V 4950) (BMNH). Paratype: 1 ♀, „New Georgia", ex JOICEY coll. (BMNH).

Description: Male fwl 23 mm; upperside colour dull steely-blue (in comparison to the dull purple of *A. tindali* or the bright mauve-blue of *A eurisus*, with both of which it flies); black marginal lines very fine; hw apex weakly angular; hw tail filamentous, tipped white; underside with superficial resemblance to *A. aruana* EVANS, 1957, from Aru and the main island of New Guinea, darker brown than *aruana* but equally lacking in contrast; underside markings narrow, irregular (in comparison with *aruana*), weakly outlined creamy-white; underside also similar to *A. cleander* C. FELDER, 1860, from New Guinea, darker, unf subapical stripe irregular (almost straight in *cleander*); hw tornal lobe small; hw submarginal and tornal iridescent markings pale blue-green. Genitalia (figs. 14a-e) typical of the genus, but dissimilar to any previously described species in the region, notably in the poorly developed (short) saccus and the broad, short (squat), valve. Female upperside bears a superficial resemblance to *A. ate* Hewitson, 1863 from Ambon and Seram (with which the only female seen was placed in the BMNH series), and *A. cleander* (upperside purple-blue of both *ate* and *cleander* less extensive); underside as male.

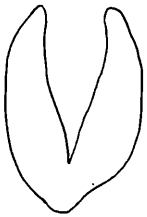
Arhopala eurisus tovesi ssp. nov. (figs. 5-6, 11-12)

Material examined: (8 ♂♂, 1 ♀). Holotype: ♂, Ulawa (north), Kellmei and Harrina village areas, SL-40 m, 24. III. 1997, W. J. TENNENT (BMNH) (gen. prep. BMNH V 4963). Paratypes: 3 ♂♂, same data as holotype (1 ♂ gen. prep. BMNH V 4964); 1 ♂, Ulawa (north), Su'umoli village area, SL, 22. III. 1997, W. J. TENNENT; 2 ♂♂, ditto, 23. III. 1997 (1 ♂ gen. prep. BMNH V 4965); 1 ♂, Ulawa (north), Harrina village area, 40 m, 25. III. 1997, W. J. TENNENT; 1 ♀, „Ulawa" [no further data], ex JOICEY coll. (all BMNH).



13a

13b



13c

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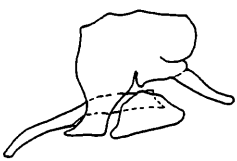
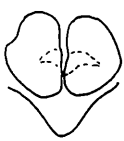


14a

14b



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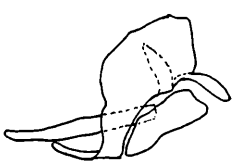
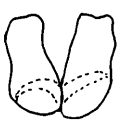


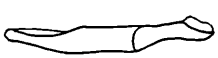
15a

15b



15c

15d



15e

Figs. 13–15: *Arhopala* genitalia. **Fig. 13:** *A. tindali*: **a:** genitalia (lateral view); **b:** uncus (posterior view); **c:** valves (posterior view); **d:** right valva (lateral view); **e:** aedeagus (lateral view). **Fig. 14 a–e:** *A. mimsyi*, ditto. **Fig. 15 a–e:** *A. e. eurisus*, ditto.

Description: Like *A. e. eurisus*. Male fwl 26 mm; upperside distinctly duller and darker; underside darker brown, pale markings less prominent, giving a less contrasting appearance; in some specimens, spaces between underside median and submedian lines lightly filled with grey-blue scales. Genitalia like *A. e. eurisus* (figs. 15a–e). Female upperside uniform dull purple-blue (bright iridescent blue, tinged greenish basally in *A. e. eurisus*) with wide dark-brown borders; underside markings well developed, prominent.

Comment: EVANS (1957: 114) included Ulawa in the distribution of *eurisus* on the basis of the solitary female in the BMNH, which remains the only female seen. It is interesting that, despite its relatively small size and geographical proximity to the large island of Malaita, many Ulawa butterfly populations are distinctive, with a high proportion of endemic taxa. *A. e. tovesi* is the endemic vicariant race of nominotypical *eurisus*, which is widespread throughout the remainder of the Solomons Archipelago.

Distribution of *Arhopala* species in the Solomon Islands

Based on several new island records obtained during recent field work, and on examination of international museum collections (TENNENT 1998), distribution of Solomon islands *Arhopala* species is tabulated in Table 1. Five *Arhopala* species were found in close proximity on Stirling Island

Table 1: Distribution of *Arhopala* taxa in the Solomon Islands.

Taxon	Shortlands	Treasury	Choiseul	Vella Lavella	Gizo	Kolombangara	New Georgia	Rendova	Santa Isabel	Russells	Guadalcanal	Savo	Florida	Malaita	San Cristobal	Ulawa	Ugi	Santa Ana
A. florinda florinda											x							
A. eurisus eurisus	x	x	x	x	x	x	x	x	x	x	x		x	x	x		x	x
A. eurisus tovesi																x		
A. tindali	x	x	x						x		x	x		x				
A. mimsyi		x					x											
A. sophrosyne		x	x								x	x				x		
A. thamyras phryxus	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	

(Treasury) in late November and early December 1997. Only *A. eurisus* was common, flying in large numbers in beach-side vegetation. The distinctive *A. thamyras* LINNAEUS, 1758, and *A. sophrosyne* GROSE-SMITH, 1889, flew in small numbers in a more wooded habitat, and single males of *A. tindali* (see above) and *A. mimsyi* were found amongst the numbers of *A. eurisus*. It is likely that the presence of this widespread species, often common where it occurs, may mask the presence of other species in the Solomon Islands. Only four females were taken; all were *eurisus*. No *Arhopala* species seems to have been reported from the remote eastern islands of the Santa Cruz group.

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